DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 03, 2011 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 11-12, 17, rejected under 35 U.S.C. 102(e) as being anticipated by Song et al (US 2004/0179596, hereafter Song).

As per **claim 1**, Song discloses a video encoder for encoding image frames that are divisible into macroblocks, comprising:

means for generating a quantization parameter (QP) estimate for the macroblocks of an image frame (Figure 3 element 330; paragraph [0036]); and

means for selection of a frame level QP for the image frame, using mode of QP estimates for the macroblocks (Figure 3 element 340; paragraph [0037] lines 1-6); wherein the QP estimates for the macroblocks and the frame level QP for the image frame respectively correspond to variables used to scale transform coefficient levels (paragraph [0032]).

As per **claim 3**, Song teaches further comprising a macroblock QP calculator in signal communication with said frame level QP selection means for calculating individual macroblock QPs using the selected frame level QP (paragraph [0037]).

As per **claim 4**, Song discloses the video encoder as defined in claim 3, wherein said macroblock QP calculator adjusts the individual macroblock QPs based on picture type (paragraph [0037] lines 1-6).

As per **claim 5**, Song discloses the video encoder as defined in claim 4, wherein said macroblock QP calculator adjusts the individual macroblock QPs to maintain more details for Intra-coded pictures than for Inter-coded pictures, and to achieve lower mean square errors for the Inter-coded pictures than for the Intra-coded pictures (paragraph [0037] lines 1-6; for an intra-coded picture (I-picture) more code is generated which means more detail is being preserved and further the reasoning behind preserving more detail would be for the purpose of using it for future prediction operation which are represented by the complexities calculation).

As per **claim 11**, Song discloses the video encoder as defined in claim 1, wherein each of the image frames represents a single picture, and the video encoder further comprises bit allocation means in signal communication with said frame level QP selection means for allocating more target bits for pictures at a beginning of a Group of Pictures (GOP) than subsequent pictures in the GOP (paragraph [0035]).

As per **claim 12**, Song discloses the video encoder as defined in claim 1, wherein each of the image frames represents a single picture, and the video encoder further comprises bit allocation means in signal communication with said frame level QP selection means for limiting a total number of bits allocated to a current Group of Pictures (GOP) when a previous GOP was coded with a number of bits one of below a pre-defined minimum threshold and above a predefined maximum threshold (paragraph [0035]-[0037]).

Regarding **claim 17**, arguments analogous to those present for claim 1 are applicable for claim 17.

Regarding **claim 27**, arguments analogous to those present for claim 11 are applicable for claim 27.

Regarding **claim 28**, arguments analogous to those present for claim 12 are applicable for claim 28.

Regarding **claim 33**, arguments analogous to those present for claim 1 are applicable for claim 33.

Regarding **claim 34**, arguments analogous to those present for claim 1 are applicable for claim 34.

Regarding **claim 35**, arguments analogous to those present for claim 1 are applicable for claim 35.

Regarding **claim 36**, arguments analogous to those present for claim 1 are applicable for claim 36.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 2, 13-16, 18, 29-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al (US 2004/0179596, hereafter Song) in view of Shimada et al (US 2002/0136297, hereafter Shimada).

As per **claim 2**, Song discloses the video encoder as defined in claim 1.

However, Song does not explicitly teach wherein the image frames comprise video data in compliance with the International Telecommunication Union, Telecommunication Sector (ITU-T) H.264 standard.

In the same field of endeavor, Shimada discloses wherein the image frames comprise video data in compliance with the International Telecommunication Union, Telecommunication Sector (ITU-T) H.264 standard (paragraph [0004]).

Therefore, it would have been one of ordinary skill in the art at the time of the invention to modify the invention of Song in view of Shimada. The advantage is the optimal rate control to maintain picture quality.

As per **claim 13**, Song discloses the video encoder as defined in claim 12.

However, Song does not explicitly teach wherein said bit allocation means limits the total number of bits using a linear weighted allocation scheme.

In the same field of endeavor, Shimada discloses wherein said bit allocation means limits the total number of bits using a linear weighted allocation scheme (paragraphs [0066] – [0068]).

Therefore, it would have been one of ordinary skill in the art at the time of the invention to modify the invention of Song in view of Shimada. The advantage is the optimal rate control to maintain picture quality.

As per **claim 14**, Song discloses the video encoder as defined in claim 12.

However, Song does not explicitly teach wherein said bit allocation means limits the total number of bits based on a virtual buffer level, the virtual buffer level for

simulating a fullness of an actual used buffer and being constrained in capacity with respect to the actual used buffer (paragraphs [0015] and [0016]).

In the same field of endeavor, Shimada discloses wherein said bit allocation means limits the total number of bits based on a virtual buffer level, the virtual buffer level for simulating a fullness of an actual used buffer and being constrained in capacity with respect to the actual used buffer (paragraphs [0015] and [0016]).

Therefore, it would have been one of ordinary skill in the art at the time of the invention to modify the invention of Song in view of Shimada. The advantage is the optimal rate control to maintain picture quality.

As per **claim 15**, Song discloses the video encoder as defined in claim 12.

However, Song does not explicitly teach wherein said bit allocation means limits the total number of bits with respect to a minimum quality and at least one of a buffer safety top margin relating to buffer overflow and a buffer safety bottom margin relating to buffer underflow.

In the same field of endeavor, Shimada discloses wherein said bit allocation means limits the total number of bits with respect to a minimum quality and at least one of a buffer safety top margin relating to buffer overflow and a buffer safety bottom margin relating to buffer underflow (paragraphs [0015] and [0016]).

Therefore, it would have been one of ordinary skill in the art at the time of the invention to modify the invention of Song in view of Shimada. The advantage is the optimal rate control to maintain picture quality.

As per **claim 16**, Song discloses the video encoder as defined in claim 1.

However, Song does not explicitly teach further comprising virtual frame skipping means in signal communication with said frame level QP selection means for virtually skipping a next frame to be encoded when a current buffer level is above a predefined maximum threshold.

In the same field of endeavor, Shimada discloses further comprising virtual frame skipping means in signal communication with said frame level QP selection means for virtually skipping a next frame to be encoded when a current buffer level is above a predefined maximum threshold. (paragraph [0027]).

Therefore, it would have been one of ordinary skill in the art at the time of the invention to modify the invention of Song in view of Shimada. The advantage is the optimal rate control to maintain picture quality.

Regarding **claim 18**, arguments analogous to those present for claim 2 are applicable for claim 18.

Regarding **claim 19**, arguments analogous to those present for claim 3 are applicable for claim 19.

Regarding **claim 20**, arguments analogous to those present for claim 4 are applicable for claim 20.

Regarding **claim 21**, arguments analogous to those present for claim 5 are applicable for claim 21.

Regarding **claim 29**, arguments analogous to those present for claim 13 are applicable for claim 29.

Regarding **claim 30**, arguments analogous to those present for claim 14 are applicable for claim 30.

Regarding **claim 31**, arguments analogous to those present for claim 15 are applicable for claim 31.

Regarding **claim 32**, arguments analogous to those present for claim 16 are applicable for claim 32.

7. Claims 3-5 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al (US 2003/0174775, hereafter Song) in view of Oktem (US 2003/0128756).

As per **claim 3**, Song discloses the video encoder as defined in claim 1.

However, Song does not explicitly teach further comprising a macroblock QP calculator in signal communication with said frame level QP selection means for calculating individual macroblock QPs using the selected frame level QP (paragraph [0037]).

In the same field of endeavor, Oktem teaches further comprising a macroblock QP calculator in signal communication with said frame level QP selection means for calculating individual macroblock QPs using the selected frame level QP (paragraph [0105]).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Song in view of Oktem. The Oktem reference selects the optimum parameter that is the closest to the originally suggested distribution as possible.

As per **claim 4**, Song discloses the video encoder as defined in claim 3, wherein said macroblock QP calculator adjusts the individual macroblock QPs based on picture type (paragraph [0037] lines 1-6).

As per **claim 5**, Song discloses the video encoder as defined in claim 4, wherein said macroblock QP calculator adjusts the individual macroblock QPs to maintain more details for Intra-coded pictures than for Inter-coded pictures, and to achieve lower mean square errors for the Inter-coded pictures than for the Intra-coded pictures (paragraph [0037] lines 1-6; for an intra-coded picture (I-picture) more code is generated which means more detail is being preserved and further the reasoning behind preserving more detail would be for the purpose of using it for future prediction operation which are represented by the complexities calculation).

8. Claims 6-10 and 22-26 rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al (US 2003/0174775, hereafter Song) in view of Jung (US 2006/0171454).

As per **claim 6**, Song discloses the video encoder as defined in claim 1.

However, Song does not explicitly teach further comprising: intra prediction means for intra predicting the macroblocks using a subset of allowable intra prediction modes to form predictions for the macroblocks; and prediction residual calculating means in signal communication with said intra prediction means and with said

macroblock QP estimation means for calculating prediction residuals for the predictions, and wherein said macroblock QP estimation means uses at least one of the residuals calculated by said prediction residual calculating means for generating the QP estimate.

In the same field of endeavor, Jung teaches further comprising: intra prediction means for intra predicting the macroblocks using a subset of allowable intra prediction modes to form predictions for the macroblocks; and prediction residual calculating means in signal communication with said intra prediction means and with said macroblock QP estimation means for calculating prediction residuals for the predictions, and wherein said macroblock QP estimation means uses at least one of the residuals calculated by said prediction residual calculating means for generating the QP estimate (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Song in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 7**, Song discloses the video encoder as defined in claim 6.

However, Song does not explicitly teach further comprising mode selection means in signal communication with said prediction residual calculating means for selecting one of the modes in the subset using a mean square error of the prediction residuals.

In the same field of endeavor, Jung teaches further comprising mode selection means in signal communication with said prediction residual calculating means for

selecting one of the modes in the subset using a mean square error of the prediction residuals (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Song in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 8**, Song discloses the video encoder as defined in claim 7.

However, Song does not explicitly teach wherein the selected one of the modes in the subset provides a most accurate prediction for a current frame than other ones of the modes in the subset.

In the same field of endeavor, Jung teaches wherein the selected one of the modes in the subset provides a most accurate prediction for a current frame than other ones of the modes in the subset (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Song in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 9**, Song discloses the video encoder as defined in claim 6.

However, Song does not explicitly teach wherein the subset includes three intra prediction modes.

In the same field of endeavor, Jung teaches wherein the subset includes three intra prediction modes (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Song in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 10**, Song discloses the video encoder as defined in claim 9.

However, Song does not explicitly teach wherein the three intra prediction modes are a vertical intra prediction mode, a horizontal intra prediction mode, and a (DC) intra prediction mode.

In the same field of endeavor, Jung teaches wherein the three intra prediction modes are a vertical intra prediction mode, a horizontal intra prediction mode, and a (DC) intra prediction mode (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Song in view of Jung. The advantage is providing the best prediction mode for power consumption.

Regarding **claim 22**, arguments analogous to those present for claim 6 are applicable for claim 22.

Regarding **claim 23**, arguments analogous to those present for claim 7 are applicable for claim 23.

Regarding **claim 24**, arguments analogous to those present for claim 8 are applicable for claim 24.

Regarding **claim 25**, arguments analogous to those present for claim 9 are applicable for claim 25.

Regarding **claim 26**, arguments analogous to those present for claim 10 are applicable for claim 26.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIKAODILI E. ANYIKIRE whose telephone number is (571)270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on (571) 272 - 7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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